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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/829,915	04/11/2001	Masami Tsukamoto	684.3179	8192

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EXAMINER	
BROWN, KHALED	

ART UNIT	PAPER NUMBER
2877	

DATE MAILED: 09/09/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/829,915	TSUKAMOTO, MASAMI	
	Examiner	Art Unit	
	Khaled Brown	2877	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 July 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *45-52 and 105-121* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *45-52 and 105-121* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *11 April 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☒ Interview Summary (PTO-413) Paper No(s)/Mail Date. *9-2-04*.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 105,106,108-114,117-120 are still rejected under 35 U.S.C. 102(b) as being anticipated by Fujie et al (US 5696623).

Re clms105,119: Fujie et al discloses an exposure apparatus comprising: a projection optical system (Fujie et al 15), having a plurality of optical elements, for projecting a pattern (Fujie et al 13) onto a predetermined plane (Fujie et al 16); a barrel for accommodating said plurality of optical elements (Fujie et al 14), gas supplying means disposed between the predetermined plane and a final optical element (Fujie et al, P in), which is one of said plurality of optical elements that is closest to the predetermined plane, said final optical element being placed at a position of an opening formed in a portion of said barrel, which portion is closest to the predetermined plane (Fujie et al, Fig 6b), said gas supplying means supplying a gas from one side of said projection optical system (Fujie et al, Fig 3b); and gas exhaust means disposed at the other side (Fujie et al, P out), opposite to the one side, for exhausting the gas, wherein said gas supplying means has a plurality of gas supply ports (Fujie et al, Ha, Hb) and said gas exhaust means has a plurality of gas exhausting ports (Fujie et al, Hd, Hc).

Re clm106: a plurality of gas supplying means (Fujie et al, Ha, Hb)

Re clm 108: cover member (Fujie et al 25)

Re clm 109: gas supply means (Fujie et al 207)

Re clms 110,111: inactive gas, nitrogen (Fujie et al Col 4 lines 41-43)

Re clms 112,113,114: impurity removing means (Fujie et al 202)

Re clm 117: temperature adjusting means unit (Fujie et al 108)

Re clm 118: UV light (Fujie et al 211)

Re clm 120: optical element (Fujie et al 15) opposed to a wafer (Fujie et al 16)

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 107,115,116 and 121 are still rejected under 35 U.S.C. 103(a) as being unpatentable over Fujie et al (US 5696623) in view of Tokuda et al (US 5995263).

Re clms 107, 115,116: Fujie et al discloses an optical apparatus comprising: an optical element (Fujie et al 15) and a means for producing a flow of gas (Fujie et al P in, H9), locally flowing to a surface of the optical element (Fujie et al Col 15 line 12). However, Fujie et al does not disclose that the gas supply means produces a laminar gas flow or an adjusting means. Tokuda et al discloses that a gas flow (Tokuda et al Fig 12 gas produced by element 130) over the surface of a lens (Tokuda et al 15A) should be a

laminar gas flow (Tokuda et al, shown in Fig 12)and that an adjusting means (Tokuda et al, Col 7 lines 14-42) should be used to avoid air fluctuation (Tokuda et al Col 2 line 37). Therefore it would have been obvious to a person of ordinary skill in the art at the time the invention was made to have the gas supply means of Fujie et al provide a laminar gas flow and to use an adjusting means to avoid air fluctuation as taught by Tokuda et al.

Re clm 121 : the combination system of Fujie et al and Tokuda et al discloses an exposing step (Fujie et al Col 1 lines 7-10). However the combination system of Fujie et al and Tokuda et al does not explicitly disclose a developing step. It would have been obvious to one of ordinary skill in the art at the time the invention was made to develop the exposed wafer of the combination system of Fujie et al and Tokuda et al because it was well know in the art at the time the invention was made to develop a wafer after exposing the wafer since this is the next step in the photolithography process.

Claims 45-47, 49, 50 and 52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Taniguchi et al (US 6496257) in view of Tokuda et al (US 5995263).

Re clms 45,50: Taniguchi et al discloses an illumination optical system (Taniguchi et al 1), a projection optical system (Taniguchi et al, PL) and a gas supplying means (Taniguchi et al 106) having a surface outlet port (Taniguchi et al 102a) . However Taniguchi does not disclose that the surface outlet port is inclined towards the surface of the optical element rather than to the image plane or use of a temperature adjusting means. Tokuda et al teaches that the surface of an outlet port (Tokuda et al 32A, 32B)

should be inclined towards the surface of an optical element (Tokuda et al 15) and a temperature adjusting means should be used (Tokuda et al Col 7 lines 20-31) because it reduces heat deformation of the lens and thus keeps the image forming property proper in the projection optical system (Tokuda et al Col 7 lines 39-41). Therefore it would have been obvious to a person of ordinary skill in the art at the time the invention was made to have the surface outlet port of Taniguchi inclined towards the surface of the optical element because it would reduce heat deformation of the lens and thus keep the image forming property proper in the projection optical system as taught by Tokuda et al.

Re clm 46: a container (Taniguchi et al Col 38 line 25, "lens barrel")

Re clm 47: a cover (Taniguchi et al 98)

Re clm 49: adjusting means (Taniguchi et al 20)

Re clm 52: the combination system of Taniguchi et al and Tokuda et al discloses an exposing step (Taniguchi et al Col 1 lines 17-24). However the combination system of Taniguchi et al and Tokuda et al does not explicitly disclose a developing step. It would have been obvious to one of ordinary skill in the art at the time the invention was made to develop the exposed wafer of the combination system of Taniguchi et al and Tokuda et al because it was well know in the art at the time the invention was made to develop a wafer after exposing the wafer since this is the next step in the photolithography process.

Claims 48 and 51 is rejected under 35 U.S.C. 103(a) as being unpatentable over Taniguchi et al (US 6496257) in view of Tokuda et al (US 5995263) as applied to claims 45-47, 49, 50 and 52 above, and further in view of Fujie et al (US 5696623).

Re clms 48, 51: The combination system of Taniguchi et al and Tokuda et al discloses the claimed invention as noted above including a gas supplying means having a gas supplying port (Taniguchi et al 102a). However the combination system of Taniguchi et al and Tokuda et al does not disclose a gas supplying means having a plurality of gas supplying ports disposed revolutionally symmetrically. Fujie et al teaches using a gas supplying means having a plurality of gas supplying ports (Fujie et al Pa, Pb) disposed revolutionally symmetrically (Fujie et al shown in Fig 2A) because it increases efficiency (Fujie et al Col 5 lines 13-17). Therefore it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use a gas supplying means having a plurality of gas supplying ports disposed revolutionally symmetrically in the combination system of Taniguchi et al and Tokuda et al because it would increase efficiency as taught by Fujie et al.

In an effort to expedite prosecution the following rejections are made:

Claims 105-121 are rejected under 35 U.S.C. 103(a) as being unpatentable over Taniguchi et al (US 6496257) in view of Fujie et al (US 5696623).

Re clms 105,109,110-114,117,119: Taniguchi et al discloses an exposure apparatus comprising: a projection optical system (Taniguchi et al PL), having a plurality of optical elements, for projecting a pattern (Taniguchi et al R) onto a predetermined plane (Taniguchi et al W); a barrel for accommodating said plurality of optical elements

(Taniguchi et al Col 38 line 25, "lens barrel"), gas supplying means (Taniguchi et al 106) disposed between the predetermined plane and a final optical element (Taniguchi et al OB), which is one of said plurality of optical elements that is closest to the predetermined plane, said final optical element being placed at a position of an opening formed in a portion of said barrel, which portion is closest to the predetermined plane, said gas supplying means supplying a gas from one side of said projection optical system (Taniguchi et al, Fig 17); and gas exhaust means disposed at the other side (Taniguchi et al 108), opposite to the one side, for exhausting the gas. However Taniguchi et al does not disclose a gas supplying means having a plurality of gas supplying ports and a gas exhaust means having a plurality of gas exhaust ports, gas supply means, inactive gas. impurity removing means or temperature adjusting means. Fujie et al teaches using a gas supplying means having a plurality of gas supplying ports (Fujie et al, Ha, Hb) and a gas exhaust means having a plurality of gas exhaust ports (Fujie et al, Hd, Hc), gas supply means (Fujie et al Pin), inactive gas (Fujie et al, N2), impurity removing means (Fujie et al 202) or temperature adjusting means (Fujie et al 108) because it increases efficiency (Fujie et al Col 5 lines 13-17). Therefore it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use a gas supplying means having a plurality of gas supplying ports, a gas exhaust means having a plurality of gas exhaust ports, gas supply means, inactive gas, impurity removing means and temperature adjusting means in the apparatus of Taniguchi et al because it would increase efficiency as taught by Fujie et al.

Re clms 106, 107: final optical element (Taniguchi et al, Fig 17, OB)

Re clm 108: a cover (Taniguchi et al 98)

Re clms 115, 116: means for adjusting flow rate and pressure (Taniguchi et al 20)

Re clm 118: ultraviolet light (Taniguchi et al Col 39 line 65)

Re clm 120: final optical element (Taniguchi et al, Fig 17, OB) and wafer (Taniguchi et al, Fig 17, W)

Re clm 121: the combination system of Taniguchi et al and Fujie et al discloses an exposing step (Taniguchi et al Col 1 lines 17-24). However the combination system of Taniguchi et al and Fujie et al does not explicitly disclose a developing step. It would have been obvious to one of ordinary skill in the art at the time the invention was made to develop the exposed wafer of the combination system of Taniguchi et al and Fujie et al because it was well know in the art at the time the invention was made to develop a wafer after exposing the wafer since this is the next step in the photolithography process.

Response to Arguments

Applicant's arguments filed 7-2-04 have been fully considered but they are not persuasive. The applicant argues that Fujie et al does not show a "gas supply port between the projection plane 16 and the optical element (pellicle 25) closest to the projection plane" (Remarks p. 11 lines 14-21). However, contrary to applicant's assertion, a pellicle is not an optical element. Fujie et al says "Pellicles 24 and 25 of thin films which scarcely change the characteristics of an optical path" (Fujie et al Col 7 lines 65-66). Additionally, the Encyclopedia of Photography discloses, "The pellicle has

virtually no effect on image-forming properties" (Encyclopedia of Photography, 3rd Edition, Stroebel and Zakia p. 52). Since the pellicle shown in Fujie et al has no effect on the projected image it is not one of the optical elements of the projection system (Fujie et al 15). Therefore Fujie et al, Fig 6b, does show a gas supply port between a projection plane (Fujie et al 16) and the optical element (Fujie et al 15) closest to the projection plane. The purpose of the pellicle is "to thereby seal the spaces between the surfaces of the outermost lenses and the external atmosphere" thus preventing nitrogen gas from escaping (Fujie et al Col 8 lines 1-33). The applicant also argues that "the Fujie et al patent nor the Tokuda et al patent teaches or suggests anything about the problem with conventional devices, which the present invention recited in independent claim 105 overcomes" (Remarks p. 12 lines 19-21). However, this allegation by the applicant is incorrect. The applicant states the purpose of his invention is to "avoid or to reduce undesirable deposition of impurities... onto the surface of the final optical element" (Remarks p. 10 lines 11-13). The purpose of the Fujie et al invention is to prevent accumulations of impurities on any of the projection optical elements. Fujie et al states "In the above manner, accumulations generated by an ultraviolet light photochemical reaction..can be effectively reduced. Therefore, accumulations at the optical system are reduced.." (Fujie et al Col 3 lines 19-23) and "With this structure, all the surfaces of lenses of the reduction lens system 15 can be protected from accumulations..." (Fujie et al Col 8 lines 29-31). For any other arguments see the above rejections.

Note: No IDS was filed with the Amendment entered July 2, 2004.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Khaled Brown whose telephone number is 571-272-2411. The examiner can normally be reached on M-F 8:30am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory J Toatley Jr. can be reached on 571-272-2800 Ext. 77. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

KB
September 3, 2004

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